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Brief Summary Text - BSTX (10):

Another method for detecting the central axis of the face is as follows: a

skin-color portion of the face is extracted as a region, and the region is projected to obtain a histogram. Then, the right and left ends of the face are determined from the histogram, whereby the line passing through the center thereof is determined as the central axis of the face (Japanese Laid-Open

Publication No. 7-181012).

Brief Summary Text - BSTX (14):

Another method is as follows: a skin-color portion of the face is extracted as a region, and the region is projected to obtain a histogram. Then, the right and left ends of the face are determined from the histogram, whereby the distance between the ends is obtained as the width of the face (Japanese Laid-Open Publication No. 7-181012).

Brief Summary Text - BSTX (20):

Furthermore, the above-mentioned method of painting out a visually determined face-skin region is troublesome regardless of whether an image to be processed is a photograph or an electronic image. Moreover, painting a portion at the boundary between the face skin region and the other regions must be conducted extremely carefully. In the case of an electronic image, the above-mentioned method of combining those pixels having similar color to that of the designated pixel to extract them as one region (e.g. "PhotoShop" as mentioned above) has been used. In this method, however, since the colors of the skin, the lip and the eyes are different, it is necessary to combine the results of several operations in order to extract the whole face-skin. Moreover, the skin color may be significantly uneven even in the same person due to, for example, different skin shades or shadows. In this case as well,

the results of several operations must be combined.

Also described above is the method of designating those pixels having a probability equal to or higher than a prescribed value as a face-skin region (the above-cited reference by R.

Funayama, N. Yokoya, H. Iwasa and H. Takemura).

According to this method,

however, a face-skin **region might not be**

successfully extracted in the case

where the image's brightness is extremely uneven due to the photographing

conditions or the conditions at the time of obtaining the image, or in the case

where the **color of the skin** is different due to a racial difference.

Brief Summary Text - BSTX (24):

Moreover, according to the above-mentioned method to detect a width of the face (Japanese Laid-Open Publication No. 7-181012), a face **skin region should**

be correctly extracted based on the color

information. However, in the case

where a background region includes a color similar to that of the face skin, a

region other than the face skin region might be determined as a face skin, or a

shaded portion in the face skin region might not be determined as face skin.

The detected width of the face might be different depending upon whether or not

the ears can be seen on the image. Moreover, the detected width could be

larger than the correct width in the case where the face is turned toward

either side.